CompTIA Linux+ System Administration 2
Course Summary

Length: 5 Days   **Prerequisite**: CompTIA Linux+ System Administration 1

Recommendation Statement:
The student should have successfully completed the CompTIA Linux+ System Administration 1 course.

Course Description:
This course is a continuation of the introductory topics taught in the CompTIA Linux+ System Administration 1 course for students who will be administering a Red Hat ® Enterprise Linux 7 system. Topics in this course also apply to the CentOS and Debian distributions. Students will learn essential Linux commands, shell features and learn how to configure and administer a Linux enterprise system.

This course prepares the student for the CompTIA Linux+ Certification LX0-104 and the LPIC-1 102 certification exams.

Upon completion of this course, you should be able to:

- Customize and use the bash shell environment
- Customize and write simple shell scripts
- SQL Data management
- Install and configure X11
- Setup a display manager
- Understand accessibility settings
- Manage users and groups, understand related system configuration files
- Automate system administration tasks by scheduling jobs
- Localization and internationalization
- Maintain the system date and time
- System logging
- Mail transfer agent (MTA) basics
- Manage printers and printing
- Understand internet protocols
- Network configuration and troubleshooting
- Configure client-side DNS
- Perform security administration tasks
- Setup host security
- Secure data with encryption

1) **Customize and use the bash shell environment**
   a) Set environment variables (e.g. PATH) at login or when starting a new shell
   b) Create bash functions
   c) Maintain skeleton directories and template files for new user accounts
   d) Set the command search path for the bash shell
2) **Customize and write simple shell scripts**
   a) Use standard sh syntax (for, while, test, if, read, seq, exec)
   b) Use command substitution
   c) Test return values for success or failure or other information provided by a command
   d) Perform conditional mailing to the superuser
   e) Correctly select the script interpreter through the shebang (#!) line
   f) Manage the location, ownership, execution and suid-rights of scripts
3) **SQL Data management**
   a) Use of basic SQL commands
   b) Perform basic data manipulation
4) **Install and configure X11**
   a) Verify support of the X11
   b) Understand the configuration of the X font server
   c) Understand the X Window configuration files
5) **Setup a display manager**
   a) Configure LightDM
   b) Turn the display manager on or off
   c) Change the display manager greeting
   d) Understand XDM, KDM and GDM
6) **Understand accessibility settings**
   a) Gain knowledge of keyboard accessibility settings (AccessX), visual settings and themes and assistive technology (ATs)
7) **Manage users and groups, understand related system configuration files**
   a) Add, modify, manage and remove users and groups
   b) Understand where user and group information is stored locally and when LDAP is employed
   c) Manage user and group information in the password and group configuration files
   d) Create and manage special purpose and limited accounts
8) **Automate system administration tasks by scheduling jobs**
   a) Manage scheduled tasks with cron and at jobs
   b) Configure user permissions to use cron and at services
   c) Configure anacron and understand configuration files
9) **Localization and internationalization**
   a) Configure the system locale and timezone; understand the configuration files and environment variables
10) **Maintain the system date and time**
    a) Set the system date and time including setting the hardware clock to the correct time in UTC
    b) Configure the correct timezone
    c) Configure NTP
    d) Understand the pool.ntp.org service
    e) Understand the ntpq command
11) **System logging**
    a) Configure the syslog daemon and the logging of messages by facility, priority and action
    b) Configure logrotate to manage system files
    c) Understand rsyslog and syslog-ng
12) **Mail transfer agent (MTA) basics**
    a) Create e-mail aliases
    b) Configure e-mail forwarding
    c) Understand the Linux mail transfer agent programs (postfix, sendmail, qmail, exim) (no configuration)
13) **Manage printers and printing**
    a) Configure CUPS for local and remote printers
    b) Manage user print queues
    c) Troubleshoot general printing problems
    d) Manage print jobs and printer queues
14) **Understand internet protocols**
    a) Understand network masks and CIDR notation
    b) Understand private and public "dotted quad" IP addresses
    c) Understand common TCP and UDP ports and services (ie. 20, 21, 22, 23, 25, 53, 80, 110, 123, 139, 143, 161, 162, 389, 443, 465, 514, 636, 993, 995)
    d) Understand major features of UDP, TCP and ICMP
    e) Understand the differences between IPv4 and IPv6
15) **Network configuration and troubleshooting**
    a) Configure network interfaces manually and automatically
    b) Understand the location and structure of supporting network configuration files

    c) Configure host settings for TCP/IP
    d) Set a default route
    e) Manually and automatically configure routing tables
    f) Understand how to add, start, stop, restart, reconfigure and delete a network interface
    g) Change, view, or configure the routing table; identify and correct an improperly set default route
    h) Debug problems associated with the network configuration

16) Configure client-side DNS
    a) Query remote DNS servers
    b) Configure local name resolution and use remote DNS servers
    c) Modify the order in which name resolution is done

17) Perform security administration tasks
    a) Audit a system to find files that have the suid/sgid bit set
    b) Manage user passwords and password aging information
    c) Use nmap and netstat to discover open ports on a system
    d) Set limits on user logins, processes and memory usage
    e) Display logged in users- current and past
    f) Understand and configure sudo for delegated privileges

18) Setup host security
    a) Understand shadow passwords
    b) Turn off unnecessary network services
    c) Understand TCP wrappers; where and when they are used

19) Secure data with encryption
    a) Configure OpenSSH 2 for remote connections
    b) Understand OpenSSH 2 server host keys
    c) Configure GnuPG configuration, usage and revocation
    d) Understand SSH port tunnels (including X11 tunnels)

Lab Exercises
Hands on lab exercises will be provided at the completion of each section